The CVS Health chain of pharmacies has offered to give you a free lifetime supply of medicine if you design its database.

- Patients are identified by an SSN, and their names, addresses, and ages must be recorded.
- Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded.
- Each pharmaceutical company is identified by name and has a phone number.
- For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company.
- Each pharmacy has a name, address, and phone number.
- Every patient has a primary physician. Every doctor has at least one patient.
- Each pharmacy sells several drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.
- Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date and a quantity associated with it. You can assume that, if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored.
- Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract.
- Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.

Design an ER diagram for CVS Health. Be sure to indicate all key and cardinality constraints and any assumptions you make. Please note that, ternary relationships are allowed.

Sony Music has decided to store information about musicians who perform on its albums (as well as other company data) in a database. The company has wisely chosen to hire you as a database designer.

- Each musician that records at Sony has an SSN, a name, an address, and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone.
- Each instrument used in songs recorded at Sony has a unique identification number, a name (e.g., guitar, synthesizer, flute) and a musical key (e.g., C, B-flat, E-flat).
- Each album recorded on the Sony label has a unique identification number, a title, a copyright date, a format (e.g., CD or MC), and an album identifier.
- Each song recorded at Sony has a title and an author.
- Each musician may play several instruments, and a given instrument may be played by several musicians.
- Each album has several songs on it, but no song may appear on more than one album.
- Each song is performed by one or more musicians, and a musician may perform several songs.
- Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.

Design an ER diagram for Sony Music. Be sure to indicate all key and cardinality constraints and any assumptions you make.

Practice for Entity Relationship Modeling

Roll Number: _____ **Name:** _____ **Date:** _____

BUET Management System

Consider a management system for BUET. There are multiple faculties in BUET, and each faculty has one or more departments. A faculty is identified by a faculty id, and needs the following information: faculty name, address. Each faculty has a Dean, who is also a teacher. There are multiple teachers, and multiple students in each department. A department is identified by a department id, and needs the following information: department name, number of teachers, and the number of students. Each department has a Head, who is also a teacher.

A teacher is identified by a teacher id, name, position, phone number(s). A student can also belong to a department, and has a student id, name, age, date of birth, Sonali bank account number. He will also have a level number, a term number, and an advisor. Note that a student can have only one adviser, however, each teacher can be an adviser to multiple students.

Task 1: Find all tentative Entity sets along-with the attributes

Task 2: Find all tentative relationship sets

Task 3: Draw Entity-Relationship Diagram (ERD) for the given System.

Practice - 1

- Construct an E-R diagram for IMDB

- For actors and directors, we want to store their name, a unique identification number, address and birthday (why not age?)

- For actors, we also want to store a photograph

- For films, we want to store the title, year of production and type (thriller, comedy, etc.)

- We want to know who directed and who acted in each film. Every film has one director

- We store the salary of each actor for each film

Practice - 2

- Construct an E-R diagram for a car-insurance company whose customers own one or more cars each.

- Each car has associated with it zero to any number of recorded accidents.

- Accidents are recorded with a date, location, and a report number to uniquely identify an accident.

- Every car has a driver, and for each reported accident, a driver must pay a damage amount.

Practice - 3

- Construct an E-R diagram for a hospital

- There are several doctors.

- A patient can set an appointment with any doctor, for which appointment date must be recorded.

- A doctor may suggest a patient to take a medical test, for which the log must be recorded.

- Now let, we want to record which test is performed by which doctor. What will be the changes in your previous diagram?